

REMARKS

Claims 1, 2, 4 and 5 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Scholl, U.S. Patent 6,025,415 in view of Yagi, JP 2000178379. This rejection is respectfully traversed.

The present invention is directed to a studless tire which possesses improved performance on snow and ice. As described on page 22, lines 16-20 of the present application, performance on ice and snow and abrasion resistance can only be improved while maintaining dispersibility of the reinforcing agent and without increasing the rubber hardness. Thus, improvement in tire performance on ice and abrasion resistance while maintaining dispersibility of the carbon black, is achieved by compounding 2 to 30 parts by weight of glass fibers in the rubber composition. The importance of glass fibers in the rubber composition of the present invention is discussed on page 5, line 16 to page 7, line 11 of the present application. Thus, glass fibers are used selectively of a large number of inorganic fibers because they are inexpensive, can increase the performance on snow and ice by providing improved abrasion resistance and can decrease the cost of the overall tire manufacturing process. The overall cost can be decreased because glass fibers are cut easily by mechanical shearing in a mixing step which enables a cutting step for long fibers to be omitted and because short fibers have a lowest specific gravity and are inhibited from splashing in the process. The glass fibers are used in an amount of 2 to 30 parts by weight and if the glass fibers are used in an amount of less than 2 parts by weight, they tend to decrease in the amount in which they protrude from the tread surface thereby achieving insufficient digging and scratching, and thus adversely affecting the performance

of the tire on snow and ice. If more than 30 parts by weight of glass fibers are utilized, they tend to increase block stiffness of the tread rubber excessively and tend to inhibit the tread rubber surface from following the snow and ice road. Thus, the Applicants have established a specific range of glass fibers which advantageously is present in the studless tire of the present invention for achieving specific advantageous results.

Also, the studless tire of the present invention contains an inorganic powder, i.e., aluminum hydroxide having an average particle size of less than 25 μm . Inorganic powders having too large an average particle size tend to decrease the abrasion resistance. On the other hand, inorganic powders having a greater average particle size than the reinforcing agent can improve dispersibility of the reinforcing agent. Advantageously, the inorganic powders have an average particle size of preferably not less than 0.03 μm as recited in claim 2 of the present application. Also, the inorganic powder, that is, aluminum hydroxide, is used in an amount of 1 to 15 parts by weight based on a 100 parts by weight of the diene rubber. Less than 1 part by weight of the inorganic powders cannot improve dispersibility of the reinforcing agent and cannot provide a desirable property. More than 50 parts by weight of the inorganic powder tends to decrease the durability.

As shown in Table 1 of the present application, the rubber composition of example 1 is obtained by compounding aluminum hydroxide and 10 parts per weight of glass fibers, which falls within the claim range of 2 to 30 parts by weight of glass fibers as recited in claim 1 of the present application. In contrast, comparative to example 1 does not contain the 2 to 30 parts by weight of glass

fibers. It should be noted that the rubber composition of example 1 is improved in performance on ice and in abrasion resistance while maintaining dispersibility of carbon black. In contrast, comparative example 1 does not possess these improved properties.

In contrast to the present invention, although the Scholl '415 reference discloses glass fibers (see column 5, line 23 of the referenced patent), the glass fibers are only one example of many examples of fillers which can be used by the prior art and furthermore the use of fillers is merely an optional component. Therefore, the Scholl '415 patent does not recognize the Applicants' solution to the problems of achieving good studless tire performance on snow and ice by specifically defining the amount of glass fibers which are added to the rubber composition to achieve the Applicants' advantageous results. Thus, the Applicants have defined a selective invention which is not even remotely suggested by the Scholl '415 patent. Furthermore, there is no recognition in the Scholl '415 patent of the importance in the contribution of aluminum hydroxide in a specific amount and with a specific particle size for improving the overall dispersibility of the reinforcing agent while increasing the durability thereof.

Furthermore, the specification of the Yagi '379 reference neither describes nor suggests a rubber composition which utilizes glass fibers. Thus, one skilled in the art would never consider improving tire performance on ice and improving abrasion resistance while maintaining dispersibility of carbon black by using glass fibers and aluminum hydroxide together, in specific amounts and in the case of aluminum hydroxide in specific particle sizes as defined by the claims of the present application. Thus, in reviewing both of the references relied upon by the

Examiner, one skilled in the art could not determine therefrom the importance of the amount of glass fibers and the importance of the presence and amount of inorganic aluminum hydroxide softener necessary to produce a studless tire having the advantageous properties as defined by the present invention. Thus, one skilled in art can only develop the specific parameters defined by the claims of the present application when taking into consideration the Applicants' own disclosure.

Accordingly, in view of the above amendments and remarks reconsideration of the rejection and allowance of the claims of the present application is respectfully requested. In the event that the Proposed Amendment does not place the present application into condition for allowance, entry thereof is respectfully requested to place the present application into better condition for appeal.

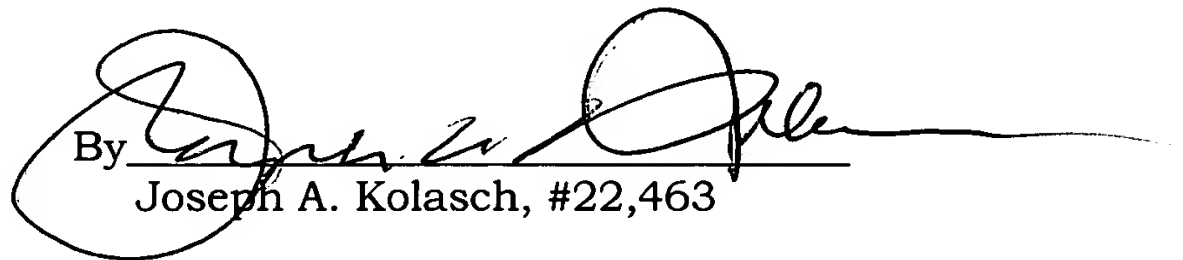
Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Joseph A. Kolasch (Reg. No. 22,463) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Joseph A. Kolasch, #22,463

JAK/pay

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

Attachment(s)